Attachment A

MMR Vaccine Concerns

1. **Allergy Reactions to Egg-related Antigens**
   Current measles and mumps vaccines (but not rubella vaccine) are derived from chicken embryo fibroblasts and do not contain significant amounts of ovalbumin. Gelatin in the vaccine may be the cause of many allergic reactions. Recent studies indicate that those with an egg allergy, even anaphylaxis, are at low risk for anaphylaxis following MMR. Skin testing with diluted vaccine is **NOT** predictive of an allergic reaction to vaccine.

   Recommendations:
   - Routinely vaccinate those with an egg allergy with any of these vaccines:
     - monovalent measles
     - monovalent mumps
     - MMR

     (Sensitivity to eggs is still a contraindication for influenza and yellow fever vaccines.)

   - After vaccination:
     - Observe for 90 minutes
     - If they have a significant hypersensitivity reaction post vaccination:
       1) Test for serologic immunity to measles, mumps and rubella. If immune, then they do **NOT** need a 2nd dose of MMR vaccine.
       2) Skin test those who are not immune. If they are hypersensitive, then proceed with desensitization of the patient for the 2nd dose of MMR.

2. **Allergic Reactions to Neomycin and Gelatin**
   Neomycin allergy most often manifests as a contact dermatitis. Non-anaphylactic reactions to either neomycin or gelatin are **NOT** contraindications to MMR vaccine. However, persons who have experienced true anaphylactic reactions to topically or systemically administered neomycin, or to gelatin, should receive MMR vaccine only in settings where such reactions can be managed, and after consultation with an allergist or immunologist.

3. **Acute Arthritis/Arthralgia**
   Arthralgia (joint pain) and arthritis can occur in **susceptible** individuals post- vaccination. Joint pain has been reported in 0.5% of children. Up to 25% of post-pubertal females may develop arthralgia and up to 10% may develop transient arthritis. These symptoms have **NOT** been reported in non-susceptible individuals (those who have previously received the vaccine or had the disease) upon **revaccination**.

   a) If joint symptoms do occur post-vaccination, they generally begin 1 - 3 weeks post vaccination, are transient, and last only 1 - 21 days.

   b) Symptoms of acute arthritis/arthralgia are much less common with post-vaccination than with natural disease, when 30 - 70% of post-pubertal women may report joint pain.

c) Persistent or recurrent joint symptoms have been reported in adult women by 1 group of investigators from Canada, but subsequent studies in the U.S. have **NOT** supported this relationship.

Recommendations:

- The potential risks of a susceptible woman having a child with congenital rubella syndrome (CRS) far outweigh risks of joint pain.
- **Vaccinate** susceptible women of childbearing age or women without adequate written documentation of immunity.

4. **Thrombocytopenia Purpura**

Reports of adverse reactions in the U.S. and other countries indicate that MMR can rarely cause clinically apparent thrombocytopenia within 2 months of vaccinations. Reported cases have been transient and benign in outcome. The estimated number of cases is 2 per 1 million doses distributed in the United States.

However, based on these case reports, the risk of vaccine-associated thrombocytopenia may be higher for those who have had a previous episode of thrombocytopenia, especially if it occurred in temporal association with MMR vaccination.

Recommendations:

If an individual has a prior history of thrombocytopenia:

- check for serologic immunity (if immune, vaccination is **NOT** in indicted)
- assess risk/benefit of vaccination
- most should be vaccinated

5. **Altered Immune Status**

Enhanced replication of vaccine viruses may occur in persons who have immune deficiency diseases and in other persons who are immunocompromised. For some of these conditions, all affected persons are severely immunocompromised. For other conditions (e.g., HIV infection), the degree to which the immune system is compromised depends on the severity of the condition, which in turn depends on the disease or treatment stage. Ultimately, the patient's health-care provider must assume responsibility for determining whether the patient is severely immunocompromised based on clinical and laboratory assessment.

6. **MMR Vaccine for HIV-Infected Individuals**

Because of reports of severe measles in symptomatic HIV-infected individuals, measles immunization (given as MMR) is recommended for HIV-infected individuals in most circumstances, including those who are symptomatic but not severely immunocompromised, as well as those who are asymptomatic.

a) Pre-vaccination HIV testing is **NOT** recommended.

b) MMR vaccine is **recommended** for routine immunization of individuals with asymptomatic HIV infection who do not have evidence of severe immunosuppression.

c) MMR vaccine should be **considered** for all symptomatic HIV-infected persons who do not have evidence of severe immunosuppression, as defined in the table below.

Measles-containing vaccines are contraindicated in those with the following:

Age Group	**Total CD4+ Count**	***-or-***	**CD4+ as a % of Total Lymphocytes**
< 12 mo.	< 750/mcL	*-or-*	< 15%
1-5 years	< 500/mcL	*-or-*	< 15%
6-12 years	< 200/mcL	*-or-*	< 15%
≥ 13 years	< 200/mcL	*-or-*	< 14%

d) It is now recommended that **severely immunocompromised HIV-infected individuals** (as defined by low CD4+ counts or low percent of CD4+ circulating lymphocytes—see above table) should **NOT** receive MMR or other measles-containing vaccines.

e) Since the immunologic response to vaccines is often poor in HIV-infected patients, the first dose of MMR should be given as early as possible after 12 months of age. This will increase the chance of an adequate immune response, before further deterioration of the immune system.

f) Give the second dose of MMR 4 weeks after the first. This will increase the likelihood of seroconversion.

g) During outbreak situations only, consider giving the first dose of **monovalent** measles vaccine at 6 - 11 months of age to those infants who are not severely immunocompromised. Remember, these children **must be revaccinated** with 2 doses of MMR beginning at 12 months of age as described above in Sections 2 and 3. Mumps and rubella vaccines cannot be given at <12 months of age.

7. **Live Virus Vaccines and Immunosuppressive Therapy**

a) After chemotherapy and other immunosuppressive therapy (except steroids—see b) below), MMR vaccine should not be given for ≥ 3 months.

b) For patients on steroids, live virus vaccines should be deferred as outlined in the table below:

Guidelines for Administration of Live Virus Vaccines and Steroid Therapy *

Steroid Therapy	Recommendations for Deferral
High dose systemic steroids daily or on alternate days for ≥ 14 days (≥ 2mg/kg QD or ≥ 20 mg QD of prednisone)	Defer live virus vaccines for ≥ 1 month after treatment has stopped.
High dose systemic steroids daily or on alternate days for < 14 days (≥ 2 mg/kg QD or ≥ 20 mg QD prednisone)	Can give live virus vaccines immediately after treatment is discontinued. However, some experts recommend deferring until 2 weeks after treatment has stopped, if possible.
Low or moderate doses of systemic steroids given daily or on alternate days (< 2 mg/kg QD or < 20 mg QD of prednisone); **or Physiologic maintenance doses of steroid** (replacement therapy)	Can give live virus vaccines on treatment.
Topical, aerosol or local injections of steroids (e.g., skin, aerosol, eyes, intra-articular, bursal, tendon injections)	Can give live virus vaccines on treatment. However, if this therapy is prolonged and there is any clinical or laboratory evidence of immunosuppression, defer for ≥ 1 month after treatment has stopped.
Children with a disease which in itself is considered to suppress the immune response and who are receiving systemic or locally acting steroids	Should not give live virus vaccines, except in special circumstances.

* Steroid therapy is **not** a contraindication for administration of **killed** vaccines.

8. **MMR Vaccine and Pregnant Women**

MMR vaccine is contraindicated in pregnant women due to the theoretical risk to the fetus. To date, there are no data demonstrating any ill effects on developing fetuses. Current data, estimated risk and recommendations are outlined below.

- **Rubella** - There is **NO** evidence that **rubella** vaccine causes CRS. However, pregnant women should not be immunized due to the theoretical risk to the fetus, estimated to be 1.6%, based on data accumulated by the CDC on 226 susceptible women who received the current RA27/3 vaccine strain during the first trimester. Only 2% of the babies had asymptomatic infection, but **none** had congenital defects. This risk is substantially less than the ≥ 20% risk for CRS associated with maternal infection in the first trimester of pregnancy. In view of these observations, receipt of rubella vaccine in pregnancy is **NOT** an indication for termination of pregnancy.

- **Mumps -** There is no evidence that mumps vaccine will cause mumps infection in an unborn fetus. Live mumps vaccine can infect the placenta, but the virus has **NOT** been isolated from fetal tissue.

- **Measles -** There is **NO** evidence that measles vaccine will cause measles infection in an unborn fetus.

Recommendations:

- **Screening** - Routine prevaccination pregnancy testing is **NOT** recommended. The American College of Obstetricians and Gynecologists, the ACIP and the AAP all state that it is sufficient to screen by asking a woman if she is pregnant.
- **Patient Advice** - Women should be informed of the theoretical risk to the fetus if they are pregnant or plan to become pregnant within 3 months following vaccination. In view of this theoretical risk, they should be advised not to become pregnant for 3 months following MMR vaccine.
- **Documentation** - Documentation in the individual's chart about this advice and her last menstrual period (LMP) is recommended, including current method of birth control, which may also be helpful.

9. **MMR and TB Testing**
   Measles vaccination may temporarily suppress tuberculin reactivity. If testing cannot be done the day of MMR vaccination, the test should be postponed for 4 – 6 weeks.

10. **Invalid Doses**
    Doses of measles, mumps, or rubella vaccines conforming to the following criteria are considered **invalid**:
    - received before first birthday
    - received after recent receipt of IG (please refer to Attachment D of measles chapter)
    - killed measles vaccine
    - killed measles vaccine followed by live vaccine within 3 months (both doses are invalid)
    - measles vaccine of unknown type received prior to 1968
    - simultaneous receipt of IG and either a further attentuated measles vaccine (i.e. containing Schwartz or Moraten strains) or measles vaccine of unknown type
    - killed mumps vaccine
    - mumps vaccine of unknown type received prior to 1979
    - live rubella vaccine accompanied by IG

    Revaccination with MMR is recommended for eligible individuals, such that at least two valid doses of measles-containing vaccine, one of mumps, and one of rubella are documented.